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The Journal of Military History, Vol. 59, No. 4. (Oct., 1995), pp. 599-618.

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Robert M. Ripperger

THE opening of World War I was a profoundly shocking and humbling experience for all the combatants. The unexpected military disasters of the first months, as well as the terrible casualties, proved a great shock to nations prepared for a brief, decisive war. Nowhere was the shock greater than in France, where the Battle of the Frontiers ended with the decimated French armies in full retreat. The doctrine of the *offensive à l'outrance* had proved a terrible, deadly failure, and the lack of heavy artillery had worsened the effects of the fallacious doctrine. German heavy artillery had suppressed the light 75-mm field pieces that formed the sole artillery armament for French divisions and corps, and French infantry often attacked with little or no artillery support, and suffered heavily. Not until the Battle of the Marne in September 1914 would the French halt the German advance, and there largely because the German infantry had outrun their artillery support.[1]

Clearly, the power of the French artillery in 1914 was inferior to that of the German. Many reasons have been offered to explain this inferiority; the most popular is the natural reluctance of the notoriously unstable governments of the Third Republic to spend money on arms. A second is the impact of the Dreyfus Affair upon the French Army. The former is untrue, and the latter only partially true. The French Army in fact had not sought heavy field artillery prior to 1914 because heavy field guns did not fit its strategy and doctrine. The secondary shocks of the Dreyfus Affair certainly slowed the construction of heavier guns, but they did not alter the officers' views on what types or quantities of guns

1. General Frédéric Georges Herr, "Field Artillery: Past, Present and Future," *Field Artillery Journal,* May-June 1927, 241–43.

they wanted, or the way in which those guns would be used. The French Army lacked heavy artillery in 1914 because such weapons did not suit its concept of war.

The roots of the French failure came from the Army's having envisaged only a limited role for heavy artillery. Among those who dominated this vision was General Hippolyte Langlois, an extremely influential military thinker, who first published his theories in a book entitled *L'Artillerie de Campagne en liaison avec les autres armes* in 1892. Langlois attempted to take into account the impact of the quick-firing artillery piece five years before the first one was introduced into service. In so doing, he was far ahead of his time, and therefore gained extraordinary influence. His vision of battle dominated the ideas of the French, and in consequence, their procurement of weapons. The artillery Langlois envisioned was mobile, rapid firing, and able to fight from open, forward positions. The fact that heavy guns did none of these things well, and light 75-mm pieces appeared to do all of them perfectly, militated against the development of heavy artillery.

The battle that Langlois outlined consisted of four phases: the "preliminary" phase, composed of the initial contact and the actions of the advance guards; the artillery duel; the "wearing battle"; and finally, the "decisive attack." The preliminary phase would consist of the cavalry and infantry advance guards of both armies coming into contact, strongly supported by the artillery. The cavalry would seize and hold critical *points d'appui*[2] until relieved by the infantry. Langlois emphasized the importance of good liaison between the advance guard and the artillery, so that the guns could provide fire support, particularly against enemy units not yet in contact. The role of the cavalry would be to screen friendly movements.[3] Langlois admitted that the artillery would have trouble finding targets, both because of smokeless powder and target dispersion, and he recommended the creation of a special liaison service (perhaps composed of cavalry noncommissioned officers) to be in direct contact with the artillery. The direct liaison between infantry and artillery could be accomplished either by the infantry signalling to the artillery for fire support, or the overall troop commander personally directing the fire of his batteries.[4] Before the advent of radio, this meant that the batteries would have to be within line of sight of the observers, and hence the opposing infantry. In the highly mobile phase of the bat-

2. This term, translated literally as "support points," is a blanket term which in the American military vocabulary has several distinct cognates, such as "choke points," "strong points," etc. Any definite translation is necessarily contextual.

3. General Hippolyte Langlois, *L'Artillerie de Campagne en liaison avec les autres armes,* vol. 2 (Paris: L. Baudoin, 1892), 39–51.

4. Ibid., 50.

tle, Langlois preferred light, mobile artillery that would fire from such necessarily open positions.

Langlois's special emphasis on the use of guns in open positions well forward practically ruled out the use of heavy weapons. Such guns would be too cumbersome to change positions rapidly, and they would also be too slow firing to engage targets rapidly, or shift fire quickly. One of the principal advantages of heavier weapons, long range, was nearly nullified by the emphasis on close engagement, the result of signalling difficulties. On Langlois's rapidly moving battlefield, it was simply too difficult to transmit orders to heavier guns in the rear, and the reaction time of those guns was in any event too slow to enable them to engage moving targets.

The artillery duel, according to Langlois, comprised the next stage in the battle, and it was to take place as both armies came up in force. Langlois's conception of this phase was farsighted as well. Batteries would fight "from ridgeline to ridgeline," firing from cover to make good use of smokeless powder. One side or the other would gain fire superiority,[5] and the battle would move into the next phase, the "wearing battle."[6] Langlois envisioned massed batteries of artillery firing in echeloned patterns to dominate a broad, deep zone, within which enemy artillery would be located. Noting the advantages of light artillery, he disparaged the large but slow-firing howitzers for being unable to blanket a deep enough zone to destroy hidden enemy artillery.

In the wearing phase of the battle, Langlois also preferred light artillery. He argued that "*speed* is the key quality for the attacker."[7] As for the decisive attack, Langlois advocated firing the guns from open positions. He viewed this tactic as a sort of calculated risk; the benefit to be gained by guns firing over open sights and redirecting their fire quickly outweighed the dangers from small arms fire. All guns supporting the attack should fire from the military crests of the hills, so as to obtain direct line of sight to the target; only those retained for counterbattery fire should remain covered. Finally, maneuverable batteries would move forward to support the advancing firing line of infantry. Once the friendly infantry had occupied new positions, the artillery would have to prepare to fire against enemy counterattacks.[8] The utility of heavy artillery for these missions, as Langlois describes them, was questionable. Certainly its relative immobility would limit its usefulness

5. Ibid., 54–55.

6. This is from the French *combat d'usure,* commonly translated as "battle of attrition." I have chosen the translation of "wearing" because it preserves the original meaning and avoids the mental baggage that comes with "attrition."

7. Langlois, *Artillerie,* 56. The emphasis is Langlois's.

8. Ibid., 57.

as a close range, direct fire weapon. Its slow rate of fire also meant that it could probably put a smaller weight of shells per minute on target than could a well-served 75-mm.

Langlois's thinking was remarkably advanced in many areas, particularly in his concept of an infantry advance supported by simultaneous artillery fire, but he often indulged in wishful thinking. Like almost all other commentators of his time, he underestimated the effects of infantry fire, the difficulties of communication, and the speed with which modern weaponry can go into action and achieve decisive results. But his thinking was creative, and it penetrated the officer corps deeply. By the time of the Russo-Japanese War, his theories had won a wide hearing, and the outcome of that war seemed to confirm his teachings.[9]

The tactical development of French field artillery in the first decade of the century followed Langlois's precepts closely. An article published by Major Wallut of the field artillery in the October 1905 issue of the *Revue d'Artillerie* elaborated the generally held views of the French field artillery quite well. Wallut emphasized the importance of liaison between infantry and artillery, particularly the requirement that artillery provide covering fire for the infantry while they move into the attack.[10] He further pointed out the discrepancy in the volumes of fire produced by the 75-mm and that of the German 77-mm, and concluded that the Germans had developed artillery heavier than the 77-mm to compensate for the higher rate of fire from the French guns.[11]

The exercises of the 19th Artillery Brigade, published in the *Revue d'Artillerie* in 1908 as an example of a model training program, offer further confirmation of the spread of Langlois's philosophies within the army, and their widespread acceptance. The exercises, a series of offensive live-fire maneuvers, took the form of artillery firing to support first an advance guard engagement, and later the different phases of the battle. The results of this simulated battle were interesting. For the meeting engagement, the batteries went into action at 5200 meters, firing at a 10 degree angle of elevation, while in later engagements they fought at a mean of 3700 meters from the enemy, and in some cases as close as 1800 meters, in both cases with sights at zero degrees elevation—in other

9. Marshal Joseph Joffre, *Les Mémoires du Maréchal Joffre,* vol. 1 (Paris: Plon, 1932), 32. Several Russian sources in the *Revue d'Artillerie,* cited after, confirm this.

10. Major Wallut, "De l'emploi du canon de 75 en campagne," *Revue d'Artillerie,* October 1905, 117.

11. Ibid., 107–8. It should be noted that Wallut compares the 75-mm to the older model 77-mm, still in widespread service at this time, but in the process of replacement. The older 77-mm had only a short recoil mechanism, and was therefore less stable (and, consequently, slower firing) than the 75-mm. The later model fired much more quickly, but was still inferior to the 75-mm in most respects.

words, with very little cover.[12] In spite of this, the theoretical conception of battle was very modern; the author advocated dividing the supporting artillery into four tactical groups: counterbattery, "breaching" (to support infantry attacks), counterattack, and *batteries d'accompagnement* to support the main attack. This represented a refinement of Langlois's thought on the matter.[13]

The tactical precepts by which the French artillery was preparing to fight were therefore simple. The primary demand upon a battery would be to provide support for the advancing infantry, above even its own security. Langlois suggested that long-range fire would be "exceptional,"[14] and that the proper role for infantry support would be close range, extremely rapid firing, which Langlois christened a *rafale*.[15] Recognizing that shorter-range artillery would be vulnerable to the infantry's rifle fire, Langlois suggested gunshields be placed on the guns.[16]

Langlois's ideas seemed to be borne out by the experiences of both the Russo-Japanese and South African wars. Langlois published a monograph in 1903, after the South African War, entitled *Tactical Changes Resulting from Improvements in Armament,* in which he examined his theories in light of the British experiences in South Africa. Not surprisingly, he concluded that the inability of the British Army to defeat the Boers stemmed less from any fundamental changes in warfare than from the ineptness of the British Army.[17] He admitted that the new weapons made the initial phases of battle increasingly difficult, but concluded that the war proved that only comparatively minor tactical changes were needed. He suggested that, particularly in the first phase, both attacker and defender needed to use more open and flexible formations, and both also needed to make better use of terrain. The use of artillery in support of the advance was increasingly necessary, and communication was more difficult than he had believed.[18]

The Russo-Japanese War of 1904–5 likewise appeared to confirm these principles. Commentators repeatedly attributed the ineffectiveness of Russian artillery to the tendency to take up defilade positions from which the batteries could not engage the infantry directly, and as a

12. General Goiran, "Tirs exécutés par la 19e Brigade d'Artillerie en 1906," *Revue d'Artillerie,* April 1908, 10.

13. Ibid., 31. These tactical groupings in many ways resemble those adopted by the Germans for the breakthrough battles of 1918—which makes the French dispositions a remarkably advanced concept.

14. Langlois, *Artillerie,* 89.

15. Ibid.

16. Ibid., 92–93.

17. General Hippolyte Langlois, *Tactical Changes Resulting from Improvements in Armament,* trans. Lieutenant W. G. Penfield (Washington: MID, 1903), 9–12.

18. Ibid., 17.

result, military opinion was very much against this sort of fire.[19] Russian veterans also confirmed the efficacy of the gunshield as protection; Colonel Bieliaev, a Russian veteran of the Russo-Japanese War, discussed the problems arising in batteries without gunshields: "At Mukden, the batteries entrenched themselves behind breastworks of sandbags. It would have been much preferable to have gunshields." He reasoned that gunshields would provide protection, and also mobility, and were therefore a better solution.[20] A German commentator whose work was translated and published in the *Revue d'Artillerie* similarly reckoned that gunshields reduced infantry fire against gunners to a sixth of its effectiveness.[21] This belief in the efficacy of gunshields made the employment of light guns at close range seem more feasible. The employment of light artillery at close range, by extension, seemed to reduce the need for heavier guns. Why fire larger weapons with little accuracy, the argument ran, when smaller ones were available that could put an equal weight of shell on target with much better accuracy?

The difficulties of long-range communication at that time also encouraged commanders to deploy their guns as close to the firing line as possible. The already noted difficulties in liaison between the Russian guns and infantry furthered this belief, as did the sometimes absurdly difficult and slow measures required to spot for guns in defilade.[22] The best solution seemed to be for batteries to fire from positions partly covered, where the artillery commander could observe the fall of shot, communicate directly by voice with the battery, and yet keep the guns in covered positions. The favored method was an upended gun limber, on which the battery commander was supposed to stand, extended by a ladder, if necessary.[23] The telephone was generally considered too unreliable, and too likely to be destroyed by artillery fire.[24]

19. Goiran, "Tirs exécutés" (April 1908), 29–30; also Anon., "Positions Défilées de l'Artillerie," *Revue d'Artillerie* (trans. from *Militär-Wochenblatt*), February 1908, 302–6. Goiran notes ("Tirs exécutés" [May 1908], 87) that the military attachés present as observers agreed that long-range fire from concealed positions would be largely ineffective.

20. Colonel S. Bieliaev, "Boucliers de circonstance de l"Artillerie Russe en Mandchourie," *Revue d'Artillerie,* May 1908, 112–13. Also Captain J. Docquin, "Le tir de l'artillerie contre les batteries à Grands Boucliers," *Revue d'Artillerie,* September 1908, 401.

21. Anon., "Positions Défilées," 302.

22. Goiran, "Tirs exécutés" (April 1908), 20, cites a battery commander who arranged for fires on four positions, rode forward on his horse to observe the fall of the shells, and then rode back to tell the battery at what range they should fire!

23. "Description et Emploi d'un observatoire de batterie," *Revue d'Artillerie,* October 1906, 115.

24. Anon., "L'artillerie ni défilée ni exposé aux vues," *Revue d'Artillerie* (trans. from *Militär Wochenblatt*), January 1908, 227; also Anon, "Positions défilées," 312.

The French were not alone in adopting Langlois's ideas on battle. The Germans and the Russians did as well. The 1908 German regulations incorporated ideas that, if not inspired by Langlois, would have been acceptable to him. They emphasized as general principles the importance of liaison, firepower, and speed of engagement.[25] These regulations also recommended the use of partially covered firing positions, but stated that "decisive action, in infantry combat, excludes all preoccupation with cover and nearly always necessitates a position partially covered or open."[26] Similarly, the regulation enjoined that "at the decisive moment, the artillery must not fear to expose itself to the most violent fires of the infantry."[27]

Langlois's ideas were the motivating force behind the Regulations of 1895 and 1913, the official sources of doctrine for the army. The 1895 Regulations cite as "indispensable conditions of success" the principles of "the spirit of the offensive, liaison between the arms, unity of effort, energy in execution, etc."[28] The 1913 Regulations also show strong evidence of Langlois's influence; they envisioned a battlefield extended over time[29] and depth,[30] much as did Langlois. They emphasized the role of cavalry operating in conjunction with infantry as an advance guard, for both security and intelligence gathering.[31] Battle would follow the initial contact, with the artillery gaining ascendancy and intervening at the decisive point to support the advance of the infantry.[32]

The dominance of light artillery therefore appeared certain. Major Wallut argued that the far higher rate of fire of French field pieces forced the Germans to deploy heavier howitzers, since otherwise the French artillery would smother the German under a huge barrage of shells.[33] Langlois noted that the speed of fire of quick-firing guns would enable a given piece to put 40 kilograms of shell on target per minute, while older guns could fire only 15 or 16 kilograms per minute.[34] Since a French 155-mm howitzer fired a 40 kilogram shell at a rate of about one round

This was not an entirely mistaken conclusion, as the Great War would show; by 1917, phone lines were frequently buried six feet under the floor of trenchlines.

25. "Le combat dans les Règlements de manoeuvre de l'artillerie Allemande et de l'Artillerie Française," *Revue d'Artillerie,* October 1908, 6.

26. Ibid., 8.

27. Ibid., 9.

28. Ministère de la Guerre, *Portant Règlement sur la Service des Armées en Campagne* (Paris: Berger-Levrault, 1910), 25.

29. Ministère de la Guerre, *Portant Règlement sur la conduite des Grandes Unités* (Paris: Berger Levrault, 1913), 25.

30. Ibid., 21.

31. Ibid., 12, 23.

32. Ibid., 34–39.

33. Wallut, "De l'emploi du canon de 75 en campagne," 107–8.

34. Langlois, *Artillerie,* 86–87.

per minute,[35] the implicit judgment was that the smaller piece was much more flexible, because of its lightness and mobility. This was an important consideration. General Goiran (the commander of the 19th Artillery Brigade) cites a setup time of thirty-one minutes for a heavy artillery battery as being very good,[36] but such times do not correspond well with his emphasis on speed of movement.[37] Nor did he envisage any particular mission for the heavy artillery that would remain outside the abilities of the normal field artillery. In the exercises of the 19th Brigade, the heavy pieces fired the same missions as the 75-mm guns, and then only for support of the infantry. The heavy artillery was unable to fire in the opening engagements due to the length of time required for setup.[38] All these findings mesh perfectly with the implications of Langlois's arguments: heavy artillery was too immobile and too inflexible, and therefore seemed to have little use in battle.

The Army consequently possessed little heavy artillery when General Joffre assumed the position of Chief of the General Staff in 1910. His memoirs discuss at length the situation of the artillery before the war.[39] In January 1911, he presented to the Supreme War Council a memorandum citing German developments in mobile field howitzers and heavy artillery; he recommended that the French adopt both a light field howitzer and organize mobile heavy artillery from existing equipment.[40] In July, the Third Bureau of the General Staff submitted to the Minister of War a report outlining the requirements for a light field howitzer and for reorganizing the heavy artillery; the Minister approved both on 27 July.[41] The plan eventually bore fruit in the development of the Model 1913 105-mm long cannon and the organization of five regiments of heavy artillery. Unfortunately, neither of these solutions was satisfactory; the 105-mm came into service so late, and in such small numbers, that it had little effect in 1914. The reorganization of the artillery similarly failed to accomplish Joffre's design of moving heavy artillery down to corps level.

Unfortunately for Joffre's plan, the responsibility for the procurement of artillery lay in the hands of the Third Direction of the General

35. "Renseignements sur l'artillerie," 53 (this is a fragment of data in my possession, reproduced from a French field manual).

36. Goiran, "Tirs exécutés," April 1908, 35.

37. Ibid., 36.

38. Ibid., 9.

39. Joffre, *Mémoires,* Chap. IV, "Artillerie légère et artillerie lourd." Curiously, this entire chapter is omitted from the English translation of Joffre's memoirs.

40. Joffre to Minister of War, January 1911, Service Historique de l'Armée de Terre (hereinafter S.H.A.T.), 4b14/15. In his memoirs, Joffre cites the impact of German counterbattery experiments at Juterborg Camp, and their intention to begin battle by gaining artillery superiority (61).

41. General Regnault to Minister of War, July 1911, S.H.A.T., 4b14/15.

Staff. This department had slowly absorbed the responsibility for artillery equipment after the late 1880s.[42] The Director, Colonel Rémy, firmly advocated the superiority of lighter artillery. Analyzing Joffre's proposal for a light field howitzer in July, 1911, Rémy stated, "If one compares our 75 with the 77 which constitutes 3/4 of the artillery of the German army corps, it is undeniable that this last is inferior, not in 'some details,' but in important points: power, stability, efficacity."[43] He further elaborated the superiority of the 75-mm over the 120-mm and 155-mm:

> If, on the other hand, we compare the results of the firings executed in France with the 75 cannon, the short 120 cannon, and the short 155 cannon, we prove that in consideration of the weight of the munitions:
>
> 1. The shrapnel shells of the curved trajectory guns, because of their dispersed sheaf and the lower velocity of their balls, have a much inferior effectiveness against exposed personnel to those of the 75 shrapnel shell.
> 2. In the short cannons, the shrapnel shell, because of the dispersed sheaf for the fused shell and because of the small number of probable hits in the limited zone where the very open sheaf of this projectile is effective, are very inferior in effect up to 4500 meters, compared to the explosive shell of the 75, against personnel protected behind gunshields, entrenchments, or walls.
> 3. The explosive shell of the short cannons fused to explode on impact on entrenchments is insufficient (as is the 155) to suppress the cover and, outside of exceptional shots, produces up to 4500m an effect on the defenders of the work very inferior to those of the ricochet of the 75 shell, because of the absorption of its explosions in the soil.[44]

Rémy's memorandum gives the technical arguments against the heavier guns. The views of General de Lamothe, head of the Commission on New Matériel, were very influential, as his letter to the Minister of War on 1 February 1913 shows. In it, de Lamothe recommended the 105-mm howitzer for adoption by the French Army, saying that "this matériel can

42. "History of the Artillery Committee" (no other information available). The dossier in which I found this article is held at the Artillery Archives at the Chateau de Vincennes, and was shown to me by Colonel(H) Pierre Vanderputten of the French Army in the spring of 1993. Further documents taken from this dossier are labelled "D.S."

43. Rémy, "Observations de la 3ème Direction au sujet de la note de présentation au Conseil Supérieur de la Guerre des questions rélatives: 1) la création d'un obusier de campagne, 2) à l'organisation d'une artillerie lourd mobile," 11 July 1911, S.H.A.T., 4b14/15, 2.

44. Ibid., 3–4.

give excellent service *as a heavy field cannon*"[45] (the italics are mine). De Lamothe went on to note that the specifications for a heavy gun with a range of twelve to fourteen kilometers and a 40 kilogram shell were issued by the Tremeau Commission in 1910—but as a siege piece, not as a field gun.[46] This difference in application is significant; siege weapons were not held at corps level, and would therefore have made little difference in the opening campaigns, although in the long run having them would be advantageous.[47] The requirement for the light field howitzer that was issued in 1911 demanded that the weapon "Have a range of 12–13 km, and that it be effective against personnel and matériel weakly protected, and [it] must be as mobile as possible."[48] De Lamothe further confirmed the widely held views on heavy artillery when he wrote, "In practice, the objectives that one will find in open country do not demand heavy projectiles, and their employment will necessarily be very limited because of difficulties of supply."[49] When, later in his letter, de Lamothe proposed the construction and testing of a 135-mm cannon, he was careful to remark that "the role of the two pieces will be absolutely different. The 105[-mm] cannon will march with the armies and often be in their midst; the very powerful cannon [the 135-mm] will necessarily be a very heavy cannon, encumbering and weakly provisioned, which will march in the rear of the columns and will be reserved for attack on large fortified positions."[50]

The French Army very obviously intended two different roles for two very different types of equipment. Field artillery would accompany the armies at all levels on campaigns, and would be present to provide direct support to them as they moved into battle. Siege guns, on the other hand, would remain in the rear of the army, and would only be used for attacks on fortresses. Additionally, the siege guns were procured only in small numbers, since they were to be used only for very selective and limited missions. Because they saw everything larger than a 120-mm

45. De Lamothe to Minister of War, 1 Feb. 1913, No. 901B, S.H.A.T., 4b14/15, 1.

46. Ibid., 2. By way of comparison, the shell for a 155-mm cannon weighs about 40 kg.

47. Ibid., 2. De Lamothe makes an elliptical reference to "motives of a political order on which it would be useless for me to insist here," that delayed adoption of the weapon.

48. Ibid., 3. De Lamothe also mentions in a letter to Minister of War Millerand (No. 3109B, S.H.A.T., 4b14/15, 4 July 1912, 2) that he suggested on 26 October 1909 the design of a light field howitzer "of a mobility comparable to that of the 75. I thought this piece was destined to replace in the army heavy artillery the 155TR, which I considered too heavy and for which the real place seemed to me to be in the siege batteries."

49. De Lamothe to Minister of War, 1 Feb. 1913, No. 901B, S.H.A.T., 4b14/15, 6.

50. Ibid., 8.

cannon as a siege gun,[51] the French did not plan to use guns of 155-mm or larger on the battlefield; they would hold them in the rear, and husband them for use in sieges. They planned to limit their heavy field artillery to pieces of 120-mm, which meant that the French artillery would automatically be outgunned by the heavier German pieces. The small scale of equipment they envisioned (Joffre's initial requirement planned four batteries of howitzers per Army Corps—sixteen guns in all)[52] was unable to match the heavier weight of German artillery, even had it been carried out.

As for the actual development and manufacture of heavy artillery, the key decisions should have come from the Artillery Committee. Unfortunately, this committee achieved little, even though it was originally created in 1872 specifically to direct studies and experiments for the artillery. It had begun work on a light field howitzer of 120-mm in 1900, but subsequently canceled it. On 12 March 1910, General de Lamothe (then head of the committee) submitted a proposal to General Brun, the Minister of War, to revive the development of a 120-mm field howitzer.[53] Any achievements along this line were abruptly halted when the committee was abolished on 5 July 1910.[54]

The project for a light field howitzer then lay untouched until 1911, a loss of almost a year. When Messimy, the Minister of War, approved Joffre's memorandum on the development of a heavy field howitzer on 27 July 1911, mobilization was only three years away. The Minister set a date of 31 December 1911 for the presentation of the guns for firing trials, and wrote in this vein to de Lamothe (in his capacity as president of the newly established Commission of New Matériel).[55] Messimy subsequently ordered that the trials be delayed for four months to provide an opportunity for the state arsenals to compete.[56] De Lamothe later blamed this decision on Messimy's desire to include weapons produced

51. Ier et 3ème Bureaux, "Note de Présentation au Conseil Supérieur de la Guerre des questions: 1) de la création d'un obusier de campagne, 2) de l'organisation d'une artillerie lourd mobile," 18 July 1911, S.H.A.T., 4b14/15, 1.

52. Ier et 3ème Bureaux, "Note de Présentation au Conseil Supérieur de la Guerre des questions: 1) de la création d'un obusier de campagne, 2) de l'organisation d'une artillerie lourd mobile," January 1911, S.H.A.T., 4b14/15, 14.

53. Various documents in D.S. provide fragmentary details about this program.

54. D.S., "Epilogue," 1.

55. Messimy to de Lamothe, 2 October 1911, No 4946-1/11, S.H.A.T., 4b14/15. Colonel Vanderputten remarked to me that the Commission took over the office space of the old Committee, and some of the messages from Rémy, head of the 3rd Direction, are misaddressed to the head of the Artillery Committee (see Rémy to de Lamothe, 15 November 1911). No. 1829D, dated 7 October 1911, specifically states that the Commission will be housed in the former offices of the Artillery Committee, and its meetings will be held in the old conference room of the Committee.

56. De Lamothe to Cie d'Homecourt, 30 Nov 1911, S.H.A.T., 4b14/15, 1.

by the state arsenals in the competition.[57] Messimy also insisted from the very beginning that the major portion of any order would have to be constructed by the state artillery establishments. He stated firmly that the government had "the obligation ... to assure the regular functioning of our establishments, and to reserve for them the major part of our orders."[58] This meant that, in effect, the government was handing over a significant portion of the order for heavy artillery to establishments run by the technical services that had opposed the order in the first place![59]

The Army eventually decided to buy 220 light field pieces, and of that order half were to come from Schneider and half from the state-owned Bourges Arsenal. The order from Schneider was eventually reduced to thirty-six, and the order from Bourges canceled completely, according to Joffre, "on the insistence of the technical services [i.e., Third Direction]."[60] Joffre remarked that the call to private industry for artillery was without precedent, and it caused resentment among the staffs of the state arsenals.[61]

The guidance Messimy gave de Lamothe stressed the requirement to construct a heavy piece as rapidly as possible.[62] To Messimy's credit, he chose his subordinate well; de Lamothe energetically canvassed both private and public producers of artillery, and even succeeded in preparing initial trials on 6 February 1912 at Harfleur for those weapons that were ready for testing.[63] By the end of January 1912, the Commission was prepared to test six weapons: a 120-mm howitzer, a 105-mm howitzer, a 120-mm cannon, and a strange 75–120 hybrid gun/howitzer, all presented by the artillery establishments. Schneider and Company presented a 105-mm howitzer and a 106.7-mm cannon.[64] The presence of both light field howitzers and long cannons is interesting; clearly, at some point the initial demand for a light field howitzer had mutated into a generic demand for a gun larger than 75-mm.

57. De Lamothe to Millerand, 4 July 1912, No 3109B, S.H.A.T., 4b14/15 1. Messimy's political motives are difficult to judge. De Lamothe does not discuss them in any great detail in any of his letters. The 105-mm howitzers were the first artillery pieces in the history of the French Army ever to be manufactured outside of state arsenals, so Messimy may well have simply followed precedent by including them in the competition.

58. Messimy to de Lamothe, 7 October 1911, No 1829D, S.H.A.T., 4b14/15 2.

59. The 3rd Direction was responsible for the running of the state arsenals.

60. Joffre, *Mémoires,* 68. Interestingly enough, Joffre notes that the cancellation of this order occurred after the authorization of funds by the budget committee.

61. Ibid., 64.

62. No. 1829D.

63. De Lamothe to Messimy, 29 December 1911, No. 20U, S.H.A.T., 4b14/15.

64. De Lamothe to Pres. of Calais Commission, 29 January 1912, S.H.A.T., 4b14/15.

Almost as soon as de Lamothe set the dates for the tests, problems arose. Rémy notified de Lamothe at the end of January that the 120-mm cannon would not be ready for firing trials before March;[65] the 120-mm howitzer would similarly be unready for trials before October.[66] De Lamothe found his relations with Messimy to be frustrating. When he requested additional personnel to run the firing ranges at Calais, Messimy brushed him off, and suggested that any extra personnel could be requested from the commander of First Army Corps—located at Lille, kilometers from the test site.[67] The difficulties involved with coordinating such bureaucratic matters halfway across northern France should be immediately obvious.

The first series of trials were held in February 1912, and the second series in March, at Calais. De Lamothe ordered the president of the Calais Commission to begin firing trials for the Schneider 106.7-mm and 105-mm by the end of the week.[68] On 5 March, the president informed de Lamothe that testing would be further delayed, because the infantry from the 1st Army Corps was using the firing grounds.[69] The firing trials to find muzzle velocities finally occurred from 11–15 March.[70] Unfortunately, a shell shortage slowed the trials; the president of the Calais Commission estimated in April that because of these shortages, trials would be dragged out into May.[71] By this time, the first weapons designed by the arsenals were nearly ready to begin firing tests. The Director of Puteaux Arsenal wrote the Minister on 23 March to inform him that the 75–120-mm and 120-mm howitzer would be ready for initial trials on 28 March.[72]

The Calais Commission met again on 10 May 1912 to discuss the trials already carried out on the 105-mm and the 106.7-mm. One member of the commission stated that he felt that the 105-mm was too light, and that a 120-mm or 155-mm field howitzer would be essential. De Lamothe pointed out that previous experience had shown that the field howitzer would need to be of the same weight as the 75-mm; a 155-mm would be much too heavy.[73] To another commission member's objection that the

65. Rémy to de Lamothe, 31 January 1912, S.H.A.T., 4b14/15.

66. De Lamothe to Messimy, 23 January 1912, No. 25U, S.H.A.T., 4b14/15.

67. Rémy to de Lamothe, 31 January 1912, No. 7653-3, S.H.A.T., 4b14/15.

68. De Lamothe to President of the Calais Commission, 1 March 1912, S.H.A.T., 4b14/15.

69. Pres. Calais Comm. to de Lamothe, 5 March 1912, No. 406, S.H.A.T., 4b14/15.

70. Pres. Calais Comm. to de Lamothe, 8 March 1912 and 22 March 1912, Nos. 416 and 506, S.H.A.T., 4b14/15.

71. Pres. Calais Comm. to de Lamothe, 11 April 1912, No. 622, S.H.A.T., 4b14/15.

72. Dir. Puteaux Arsenal to Messimy, 23 March 1912, No. 7066C, S.H.A.T., 4b14/15.

73. PV, Calais Comm., 10 May 1912, S.H.A.T., 4b14/15, 2. "PV" is the French abbreviation for the *procès-verbal* or transcribed minutes of the meeting.

gun would be too light to use against even light fortifications, de Lamothe replied that if the caliber of the 106.7-mm were reduced to 105-mm, it would have an effective range of twelve kilometers and a good effect on field fortifications. The range was to be the compensating factor.[74] The commission decided to continue testing both weapons.

De Lamothe relayed many of these concerns to the Minister (now Millerand, following a governmental change) in a letter of 4 July. He recommended the admission of both the 105-mm howitzer and the 106.7-mm cannon to the third series of trials. The majority opinion as a result of the tests was in favor of the 106.7-mm, since that weapon seemed sturdy, light, and accurate. De Lamothe noted, however, that the requirement for a long field gun was not as well defined as that for the howitzer. His recommendation was therefore to continue testing, both at autumn maneuvers and on the firing ranges, to get a better idea of the capabilities of the two guns.[75] Unfortunately, the Minister was less than pleased with the progress of testing. He sent a letter to de Lamothe on 13 December ordering him to canvass private industry for available siege and fortress artillery in the 120-mm to 155-mm range.[76] De Lamothe was, quite naturally, incensed at what he must have regarded as a slighting of his efforts both as director of the Artillery Committee and the commission. He responded with a scathing letter five days later, expounding furiously not only on the danger facing the French Army, but on his own efforts to avert that danger.[77]

Most revealing was his commentary on the siege and fortress artillery. He pointed out that he had tried to push programs to create a light field howitzer, a 155-mm cannon, and a 120-mm cannon. He stated the "fundamental principle" underlying his program: "the maximum of mobility compatible with firepower."[78] Interestingly enough, however, the mission he envisaged for the use of the proposed 155s and 120s was not as heavy field guns, but rather as siege pieces "for the attack and defense of places."[79] That such weapons would probably be procured in small numbers, and husbanded carefully for siege work, goes almost without saying.

Millerand's reply to de Lamothe was also sharp, and addressed mostly personal issues. In addition to accusations of "leaking," de Lamothe had accused various unnamed people "in high places"[80] of

74. Ibid., 7.
75. Ibid.
76. Millerand to de Lamothe, 13 December 1912, No. 59750-2/3, S.H.A.T., 4b14/15.
77. De Lamothe to Millerand, 18 December 1912, No. 304, S.H.A.T., 4b14/15, 1.
78. Ibid., 2.
79. Ibid., 7.
80. Ibid.

interfering with his work. Millerand was understandably displeased with these assertions, and he admonished de Lamothe strongly. His letter indicates, however, that he clearly intended for General Sylvestre to procure commercial examples of 120-mm and 155-mm pieces for comparative study as siege weapons.[81]

As the trials with the 105-mm and 106.7-mm proceeded, the Balkan Wars rumbled across southern Europe. They were regarded, rightly, as harbingers, and the French Army sent several distinguished observers, most notably General Frédéric Herr, to learn what they could from the fighting. Herr subsequently published a journal of his experiences in the Balkans, and several of the younger officers published their experiences in various military journals.[82]

One of the observers, Captain Bellenger, published his notes in the *Revue d'Artillerie* in November of 1913. These notes seemed to confirm both Langlois's tactical precepts and the conventional wisdom of the French Army on field guns. The difficulties in transmitting commands to batteries behind reverse slopes, according to Captain Bellenger, hampered the effectiveness of the Bulgarian artillery, but the Serbs experienced better success firing from near the crests of ridgelines.[83] Bellenger observed that defilade usually reduced the effectiveness of the guns employed.[84] He also noted that duels between concealed artillery batteries were "most useless," and that guns were better employed supporting friendly infantry.[85] Reassuringly, he noted that trenchlines could be carried with close cooperation between infantry and artillery.[86] His opinions on heavy artillery were interesting as well. He stated that the Serbs and Bulgarians did not use heavy artillery, except in desperation, or when in need of long-range fire.[87] Heavy guns, he noted, were not needed when attacking trenches, since light guns would suffice.[88] He also noted a number of general problems often cited by opponents of heavy artillery; the guns were cumbersome,[89] and the use of ammunition "exceeded all

81. Millerand to de Lamothe, 23 Dec 1912, No. 61475-2/3, S.H.A.T., 4b14/15. The mention of the Pyot piece (a 120) and the Filloux (a 155) in this context is the source of this inference.

82. Herr's narrative is, unfortunately, very difficult to find; I was unable to use it as a source.

83. Captain G. Bellenger, "Notes on the Employment of Artillery in the Balkan Campaign," *Revue d'Artillerie,* November 1913, trans. Major J. S. McNair (Washington: MID, 1914), 1.

84. Ibid., 5.

85. Ibid., 6.

86. Ibid., 5.

87. Ibid., 10.

88. Ibid., 11–13.

89. Ibid., 7; this was mentioned with respect to comparatively light 87-mm Krupp guns.

expectations."[90] The use of heavy guns in fluid situations was therefore not essential, and the heavy artillery was only an additional "margin of security."[91]

The Calais Commission continued testing on the 105-mm and 106.7-mm throughout 1913. There were moments of prophecy, as when General Baquet (designer of the model 1890 120-mm and 155-mm pieces, and the doubting Thomas of the light artillery) aired his opinion in the meeting of 27 January that the 105-mm would be too light for use against many obstacles, and that something heavier was needed.[92] But the views of officers such as Bellenger who doubted the need for heavy artillery had already come to roost in the commission, and they shaped the project for the 105-mm. Herr, sitting as a member of the commission, remarked that range was a more immediate concern than weight of shell.[93]

The commission decided to adopt a version of the 106.7-mm cannon, rebored to 105-mm, as the standard long-range piece; it was a cannon, not a howitzer.[94] De Lamothe incorporated the suggestions of the Committee into his report to the Minister of 1 February 1913. In it, he recommended the adoption of the 105-mm long gun, rebored from the 106.7-mm. He noted the tendency of foreign artilleries to use very long ranged weapons[95] and the recent improvements in both spotting and gun technology.[96] Moreover, the experiences of the Balkan Wars emphasized the value of long-range heavy artillery.[97] Warfare in open country would not require large-caliber rounds, and heavy guns would in any case be of only limited use because of the limited supply of projectiles available.[98]

De Lamothe went on to elaborate on the reasons why a 105-mm gun should be adopted rather than a larger one. While he conceded that a larger gun was necessary, he felt that it would be a siege, rather than a field, piece.[99] The 105-mm would move with the armies, and support their attacks, while heavier pieces would remain in the rear and would support attacks on fortresses.[100] De Lamothe recommended the immedi-

90. Ibid., 10.

91. Ibid., 30.

92. PV, Calais Commission, 27 January 1913, S.H.A.T., 4b14/15. My copy of the minutes of this meeting is unfortunately incomplete.

93. Ibid., 2.

94. Lieutenant Colonel Leduc, "Canon de 105mm Long Présenté par Messieurs Schneider et Compagnie: Avis de La Commission," 25 January 1913, S.H.A.T., 4b14/15.

95. De Lamothe to Millerand, 1 February 1913, No 901B, S.H.A.T., 4b14/15 4.

96. Ibid., 5.

97. Ibid., 6.

98. Ibid.

99. Ibid., 8.

100. Ibid.

ate adoption of the 105-mm; on the day he wrote his memorandum, there were still 17 months of peace ahead.[101] The Commission pursued other research in the time still left to it; it began testing for the remaining weapons envisaged in de Lamothe's siege program. The weapons envisaged as siege guns were the equals of the heavier German weapons commonly attached at corps level: 105-mm, 150-mm, and 130-mm.[102] Millerand issued the requirement to de Lamothe for the testing of 155s and 120s on 13 December 1912, and the initial tests for stability and mobility were conducted in early March 1913.[103] Problems with the howitzer submitted by Puteaux Arsenal delayed further testing until May of 1913.[104]

In May 1913, both guns failed to meet accepted standards of mobility and range of fire.[105] The Calais Commission rejected both guns, and finally decided to pursue a 120-mm gun on a modified Schneider carriage.[106] The commission continued to deliberate on the 120-mm and did not recommend acceptance of the gun until May 1914.[107] The commission also examined the 155-mm on a Schneider carriage, and recommended its adoption in October of 1913.[108]

The most honest, if later regrettable, epilogue on three years' work was written by Colonel Hallouin, chief of the Third Bureau, for the Director of Artillery. In it, Hallouin summarized the decisions of the Minister on the subject of heavy artillery. There would be, he explained, no howitzers attached at corps level.[109] The artillery attached at army level would be a mixture of long and short ranged cannons (not howitzers), numbering about four hundred pieces for the entire French Army.[110] At army level, several regiments of heavy artillery would be organized,

101. Ibid.

102. PV, Commission for Studies of New Matériel for Sieges and Forts, Session of 20 February 1913, No. 1587H. Significantly, no mention was made of the heavier weapons soon to see much use, such as 420s, 305s, or even 210s.

103. PV, Bourges, 12 March 1913.

104. PV, 12 March 1913, S.H.A.T., 4b14/15.

105. PV, 21 May 1913, S.H.A.T., 4b14/15.

106. PV, 17 July, 1913, S.H.A.T., 4b14/15.

107. Présentation à la Commission d'étude des Nouveaux Matériels d'Artillerie d'un Canon Long à Grande Portée de Calibre Moyen (undated, but post PV of 20 May 1914), S.H.A.T., 4b14/15.

108. PV, Calais, 31 October 1913, No. 6709B, S.H.A.T., 4b14/15.

109. Hallouin to Director of Artillery, 28 October 1913, No. 1274-3/11, S.H.A.T., 4b14/15 1.

110. No. 1274-3/11, 1. Douglas Porch (*March to the Marne: The French Army, 1871–1914* [Cambridge: Cambridge University Press, 1981]) puts the total for the German Army at 2000; Colonel Vanderputten estimates the total actually available to France in 1914 at 544.

equipped eventually with naval guns,[111] and the projected 120-mm and 155-mm guns would be used along with some new heavy mortars.[112] Finally, some batteries of 120-mm would be equipped with tractors to increase mobility.[113]

The weapons ordered before 1914 would be the ones that accompanied the army into battle, and they were not great in number or variety. The new 105-mm pieces did not come in large numbers, and the 155-mm would be unavailable before late 1914. The five heavy artillery regiments disposed of a mere 544 guns,[114] and those were held at Army level. None of the heavy artillery regiments held anything larger than a 155-mm gun, and the artillery organic to the army corps contained only 75-mm guns. This was the artillery with which France went to war in 1914, and it was woefully deficient.

In summary, heavy artillery did not fit French doctrine, and was not suited to Langlois's conceptions of the use of artillery in battle. The Army believed heavy weapons lacked mobility, and consequently classified them as siege artillery. In spite of this (or perhaps as a remedy for it), de Lamothe emphasized the importance of mobility in his 1910 siege program—a good example of the degree to which the obsession with mobility had penetrated the French Army. The apparently cumbersome nature of siege weapons guaranteed that they would be held far in the rear and used only on certain strongly fortified targets. The nature of their mission guaranteed that they would be few in number.

The artillery that the Army wanted to fight the kind of battle Langlois expected was of necessity light and quick firing. Only quick-firing artillery could provide the kind of rapid, smothering fire Langlois preferred, and only light artillery could respond quickly on the fluid battlefield he envisaged. When heavy artillery was designed, it was corseted into Langlois's conceptions; mobility became the greatest priority, and other considerations were strictly secondary.

In spite of this critique, we must remember that Langlois's conception of battle was remarkably modern. His significant errors were in questions of detail. His conception of the phases of battle strongly resembled those of 1914, and his emphasis upon the importance of combined arms is today echoed by modern writers. Even his ideas on the use of artillery were, in many ways, up to date. But he made the very simple but important mistake of underestimating the damage modern weapons

111. No. 1274-3/11, 2. These units would be formed with nothing heavier than 155s, and they would be formed by shifting personnel from coastal units.

112. No. 1274-3/11. I have not covered the 370-mm mortar in this paper, because of the nature of the weapon and the very small number produced.

113. Ibid., 3–4.

114. Colonel Pierre Vanderputten, "Artillerie Lourd du Plan XVII," data sheet given to me in March 1993.

could inflict, and the speed and accuracy with which they could fire. This caused him to advocate the sort of fire support most effectively delivered by a light artillery at close range. The concentration on this sort of fire support was almost certainly detrimental to the development of heavier weapons.

The conceptual basis for the heavy artillery was therefore lacking; how then do we explain its development in the years prior to 1914? To some degree, this was due to the unceasing efforts of officers like de Lamothe, and to some degree, the efforts of politicians. In both cases, however, their efforts often seem to have included a somewhat retarding effect. The soldiers tried to develop artillery within the framework of a doctrine stressing mobility over all, and the politicians permitted political concerns to intrude upon decisions. Certainly Messimy's insistence that the arsenals construct the 105-mm gun is an example of this, just as is de Lamothe's repeated insistence that a 120-mm or 155-mm gun was a siege piece, and therefore too heavy to accompany the highly mobile armies.

The dissolution of the Artillery Committee in 1910 also slowed the development of heavy weapons, but given the role they would have assumed (i.e., emphasizing siege weapons), would they really have made a difference? Considering the inordinately small number of French heavies in 1914, compared with the Germans, it is difficult to see how one or two hundred additional heavies, held at Army level, could have changed the outcome of the Battle of the Frontiers. Even the weapons that existed were hardly employed until the bloody losses to German artillery revealed the errors in French thinking. With many commanders unwilling to use any artillery support at all in the first battles, it is difficult to see how they could have taken advantage of heavy artillery.

The French Army therefore lacked heavy artillery in 1914 less for reasons of politics than for reasons of doctrine. The heavy losses in the opening battles testify to failures both of conception and training. The commanders who ordered hasty attacks without adequate support in the belief that they must seize key positions or locate enemy forces only followed accepted doctrine.[115]

For all my criticism of him, Langlois must be given his due. He could have scripted the Battle of the Marne,[116] and his emphasis on the rapid flow of battle influenced a whole generation of French military educa-

115. The entire Battle of the Frontiers presents certain aspects of one of Langlois's battles gone mad; if the initial attacks *à l'outrance* are examined in the light of his views, the actions of the French commanders make better sense; most of them were intended to drive in enemy screens, seize key *points d'appui,* or "develop the situation."

116. The German heavy artillery was all in the rear, and the French heavies were largely out of action, from overuse if nothing else.

tors, such as Foch and de Maud'huy. He was, in a sense, a strong contributor to the furthering of the French military tradition of aggressive commanders capable of acting on their own initiative. It would be those officers, men such as Foch, de Castelnau, Galliéni, and Franchet d'Esperey, who led the French Army first to victory on the Marne, and later to the triumphs of 1918.

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